

Appl. No. 10/502,110

Attorney Docket No. 10555-085

I. Listing of ClaimsRECEIVED
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1. (Cancelled)
2. (Currently Amended) A [[The]] planar avalanche photodiode of claim 1 further comprising:
an n-type semiconductor layer defining a contact area;
a semiconductor layer having a p-type diffusion region, the p-type diffusion region having a smaller area than the semiconductor layer;
a semiconductor multiplication layer;
a semiconductor absorption layer;
a p-type contact layer;
wherein the p-type diffusion region is disposed directly adjacent to the p-type contact layer and the semiconductor absorption layer is disposed between the semiconductor multiplication layer and the semiconductor layer with the p-type diffusion region; and
at least one grading layer disposed adjacent to the semiconductor absorption layer.
3. (Currently Amended) The planar avalanche photodiode of claim [[1]] 2 further comprising a p-type semiconductor charge control layer disposed adjacent to the semiconductor multiplication layer.
4. (Currently Amended) The planar avalanche photodiode of claim [[1]] 2 further comprising at least one n-type contact layer.
5. (Currently Amended) The planar avalanche photodiode of claim [[1]] 2 wherein the n-type semiconductor layer is InAlAs.
6. (Currently Amended) The planar avalanche photodiode of claim [[1]] 2 wherein the semiconductor layer with the p-type diffusion layer is InAlAs.

BRINKS HOFER GILSON & LIONE
PO Box 10395
Chicago, IL 60611-5599

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7. (Currently Amended) The planar avalanche photodiode of claim [[1]] 2 wherein the semiconductor multiplication layer is InAlAs.

8. (Currently Amended) The planar avalanche photodiode of claim [[1]] 2 wherein the semiconductor absorption layer is InGaAs.

9-19. (Cancelled)

20. (Previously Presented) A planar avalanche photodiode comprising:

an n-type semiconductor layer defining a contact area;

a semiconductor multiplication layer;

a semiconductor absorption layer, the semiconductor multiplication layer being disposed between the first n-type semiconductor layer and the semiconductor absorption layer;

a p-type semiconductor contact layer having a smaller area than the absorption layer, the semiconductor absorption layer being disposed between the semiconductor multiplication layer and the p-type semiconductor contact layer;

wherein the photodiode has a low field region near the p-type semiconductor contact layer and a low capacitance at least one grading layer disposed adjacent to the semiconductor absorption layer; and

at least one grading layer disposed adjacent to the semiconductor absorption layer.

21. (Previously Presented) The planar avalanche photodiode of claim 20 further comprising a p-type semiconductor charge control layer disposed adjacent to the semiconductor multiplication layer.

22. (Previously Presented) The planar avalanche photodiode of claim 20 wherein the n-type semiconductor layer is InAlAs.



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23. (Previously Presented) The planar avalanche photodiode of claim 20 wherein the semiconductor multiplication layer is InAlAs.

24. (Previously Presented) The planar avalanche photodiode of claim 20 wherein the semiconductor absorption layer is InGaAs.

25. (Previously Presented) The planar avalanche photodiode of claim 20 wherein the p-type semiconductor contact layer is InAlAs.

26. (Previously Presented) A planar avalanche photodiode further comprising:

an n-type semiconductor layer defining a contact area;

a semiconductor multiplication layer;

a semiconductor absorption layer, the semiconductor multiplication layer being disposed between the first n-type semiconductor layer and the semiconductor absorption layer;

a p-type semiconductor contact layer having a smaller area than the absorption layer, the semiconductor absorption layer being disposed between the semiconductor multiplication layer and the p-type semiconductor contact layer;

wherein the photodiode has a low field region near the p-type semiconductor contact layer and a low capacitance at least one grading layer disposed adjacent to the semiconductor absorption layer; and

a passivated region including a semiconductor layer disposed between the p-type contact layer and the semiconductor absorption layer.

27. (Original) The planar avalanche photodiode of claim 26 wherein the passivated region includes a portion of a first grading layer and a portion of the semiconductor absorption and multiplication layers.

BRINKS
HOFER
GILSON
LIONE

BRINKS HOFER GILSON & LIONE
PO Box 10395
Chicago, IL 60611-5599

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